SPARSE AND EFFICIENT BLOCK FACTORIZATION FOR INTERACTION DATA

Abstract of the Disclosure

A compression technique compresses interaction data. The interaction data can include a matrix of interaction data used in solving an integral equation. For example, such a matrix of interaction data occurs in the moment method for solving problems in electromagnetics. The interaction data describes the interaction between a source and a tester. In one embodiment, a fast method provides a direct solution to a matrix equation using the compressed matrix. A factored form of this matrix, similar to the LU factorization, is found by operating on blocks or sub-matrices of this compressed matrix. These operations can be performed by existing machine-specific routines, such as optimized BLAS routines, allowing a computer to execute a reduced number of operations at a high speed per operation. This provides a greatly increased throughput, with reduced memory requirements.